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LESSONS FROM THE WAR AND THEIR APPLICATION IN THE TRAINING OF TEACHERS.

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Report of a "Conference of men from institutions in the Mississippi Valley engaged in training teachers of the manual arts and industrial education," called by the Commissioner of Education in response to a formal request made by representatives of the institutions concerned, and held at the Indiana State Normal School, Terre Haute, Ind., December 5, 6, 7, 1918.

The members of the conference included representatives from 13 institutions in 8 States, as follows: Illinois, 3; Indiana, 3; Michigan, 1; Missouri, 1; Ohio, 3; Tennessee, 1; Texas, 1; Wisconsin, 1; District of Columbia, 1; total, 15.

There were present also representatives of the State Departments of Public Instruction of Indiana and Wisconsin, and of the Federal Board for Vocational Education. In addition, a number of visitors were present by invitation.

PROGRAM.

Chairman: WILLIAM T. BAWDEN, Specialist in Industrial Education, United States Bureau of Education.

- I. War Aims Courses in the Vocational Section of the Students' Army Training Corps; Prof. Frank S. Bogardus, Indiana State Normal School, district director, Committee on Education and Special Training, War Department.
- II. Practice Teaching; Progress Report of the Conference Committee; chairman, Albert F. Siepert, Bradley Polytechnic Institute, Peoria, Ill.; Fred C. Whitecomb, Miami University, Oxford, Ohio.

- III. Development of Teacher-Training Courses in Trades and Industries; Kenneth G. Smith, agent for industrial education, Federal Board for Vocational Education, Indianapolis, Ind.
- IV. Industrial Arts in Secondary Schools; William T. Bawden, United States Bureau of Education.
- V. Examination and Certification of Teachers; Progress Report of the Conference Committee; Arthur B. Mays, chairman, Sam Houston Normal Institute, Huntsville, Tex.
- VI. Some Lessons from the Army Training Schools; Robert W. Selvidge, Peabody College for Teachers, Nashville, Tenn., district educational director, Committee on Education and Special Training, War Department.
- VII. How Mechanics are to be Inducted into the Work of Teaching; Ira S. Griffith, University of Missouri, Columbia, Mo.; George F. Buxton, Indiana State University, Indianapolis, Ind.

A thoughtful summary of the first day's discussion was presented by M. L. Laubach, Indiana State Normal School; of the second day's discussion by Robert H. Rodgers, Stout Institute, Menomonie, Wis.; and of the deliberations of the conference by Dean C. A. Bennett, Bradley Polytechnic Institute, Peoria, Ill.

SUMMARY OF DISCUSSION.

Each leader of discussion was requested to formulate a brief outline of his remarks, mimeographed for presentation to the conference. After the discussion these outlines were referred to a reviewing committee, consisting of R. W. Selvidge, R. H. Rodgers, and C. A. Bennett. The substance of these outlines, as approved by the committee, is included in the following paragraphs.

INTRODUCTORY.

In the absence of President Parsons, Prof. Cox welcomed the members of the conference to the Indiana State Normal School, indicating his belief that future significant developments in education will be in the field of industrial education. New forms of education have come in, not to replace the old education, for much of the old education still remains fundamental and vital to the development of child life, but in response to changing economic and social conditions.

Educators must assume the responsibility of studying these changing conditions, and of seeing to it that education evolves in such a way as adequately to meet the conditions, and to serve the real needs of children.

I. WAR-AIMS COURSES.

Prof. Bogardus pointed out the reasons for the organization of the War-Aims Courses in the Vocational Section of the Students' Army Training Corps, and the difficulties encountered, because of the varying degrees of education represented by the men in the camps, and other considerations. One hour per week was devoted to a study of the aims and issues of the war, and the time thus spent

was regarded by those in authority as of equal importance with the military instruction. Indeed, it was made actually a part of it.

The reason for the success of this work was its very definite and concrete aim, namely, to inspire every soldier with the intense purpose to do everything he possibly could to help win the war, to develop a sense of personal responsibility to use the skill acquired in these vocational classes to the very best advantage to this end.

ADJUSTMENT TO MATURITY OF STUDENT.

1. Certain difficulties were due to the failure of the instructor to adjust his vocabulary to the mental caliber of his students. Many of the boys in the camps, so far as schooling goes, were no more than eighth-grade graduates and were unable to understand many terms in common use in the discussion of the war. College professors were some of the worst offenders in this respect, being prone to forget that they were not dealing with college students. It was usually necessary to build up a vocabulary for the students in advance of the discussion, writing lists of words on the blackboard, etc.

2. It is important in all school work that the instruction be carefully adjusted to the stage of general maturity of the student. We had opportunity in the camps to note the emotional reaction of these young men, averaging in age from 21 to 25 years, and comparing with that of the usual college freshmen, averaging in age around 18 or 19 years. Notwithstanding a less extensive schooling, the soldiers manifested a certain superiority in mental maturity and understanding, undoubtedly due to experience with life problems.

3. A study of the conditions in the camps disclosed an almost unbelievable state of ignorance on the part of the young men as to the real issues of the war and as to the reasons why the United States entered the war. Evidently many of the young men had not been reading current literature with discrimination or understanding.

4. This was a unique experiment in education, in that the waraims lessons furnished the humanistic or cultural element in the war-preparation scheme. Aside from this one hour per week, the whole program was a constant grind for efficiency; this course furnished the real motive for the technical vocational work.

THE WORKER A HUMAN BEING.

Unquestionably, our program for vocational education must include something which represents the humanistic element; it must recognize that the individual is a human being, always, and not simply a producer, or a cog in an industrial machine. One possible shortcoming of vocational education is that we may overemphasize the training of the individual for production, without giving adequate attention to preparation for the other phases and duties of

life. An increase in earning capacity, due to special vocational training, is not necessarily accompanied by increased ability to spend wisely and effectively.

Some new and more effective method must be devised to help young people to understand the meaning of the things they do. A young man who studies some technical process, as in plumbing, is not interested in the history of the subject, especially if the history is presented in the traditional lifeless way. It is possible, however, to present it in such a way as to have definite applications to real problems and situations of daily living.

A ditch digger, perhaps, can not be interested extensively in the history of sewers, but he should know what sewers mean to people. This can not be done in words only; it is not simply a question of lectures and discussions. Furthermore, it is not only the ditch digger who needs to know about the meaning of sewers. Society, as well as the worker, needs the new point of view.

II. PRACTICE TEACHING.

In introducing the report of the committee, Prof. Siepert suggested that the discussion at this session deal mainly with problems of management or administration of practice teaching.

Bulletin, 1917, No. 29, of the Bureau of Education, "Practice Teaching for Teachers in Secondary Schools," contains a summary of recommendations of the committee of the Society of College Teachers of Education (see pp. 72-75), from which the following extracts are taken. Recommended:

- (a) That the term "practice-teaching" be discarded.
- (b) That the term "practical work," or "laboratory work," be substituted.
- (c) That one hour of practical or laboratory work per day per semester be regarded as a desirable unit for credit; this unit to include observation, apprentice work, and directed teaching (as defined in the report), and to include work in two subjects, or different years in one subject.
- (d) That demonstration lessons be encouraged.
- (e) That a type of practical or laboratory work for teachers of experience be developed differing in nature from that for inexperienced teachers.

The discussion called attention to one of the important features of the Army scheme of vocational training—the requirement that instructors rate the men, on four points: (1) Mechanical ability; (2) speed; (3) resourcefulness; (4) personal qualities.

PROPOSITIONS.

The committee submitted a number of propositions for discussion, as follows:

1. Assuming each to be up to the standard, one important difference between manual arts and industrial education is a difference of

degree rather than in kind. Good manual training has distinct vocational value.

2. The place where mastery of a process is gained is of less consequence than possession of such mastery; hence, credit should be allowed for either school shop or commercial shop experience.

3. The determination of standards of attainment as a mechanic, and appropriate tests for measurement, are vital problems in teacher training which merit further consideration by this conference.

4. The ideal teacher is well qualified in at least three respects: (a) Theory—knowledge of how and why to do a thing; (b) Practice—ability to do it; (c) Teaching technic—ability to impart to the student what he knows and can do.

5. Therefore, teacher-training institutions must arrange to—(a) Ascertain the student's ability as a workman; (b) round out weak spots in both theory and practice; (c) give skill (practice) in teaching, as well as knowledge of principles (theory) of teaching.

6. The essential factors in successful practice teaching are: (a) Careful preparation before the teaching; (b) skillful supervision while the teaching is done; (c) analysis of lessons and methods after the teaching, for the purpose of determining the elements of success or failure.

7. A successful lesson plan requires that a distinction be made between "content," the thing to be taught, and "method," how to teach it.

8. A knowledge of the stages of learning is as essential as a knowledge of the subject matter to be taught and a knowledge of the proper methods of teaching.

9. Observation of expert teaching, with subsequent conference and discussion, is valuable to the beginner, (a) as a model to imitate, and (b) as a standard by which to judge his own work.

10. Breadth of view, insight, resourcefulness, and understanding of principles, rather than rules of class management, are the ends to be sought.

11. As the school-trained teacher requires contact with industry to become a successful trade teacher, so the mechanic who would become a teacher needs practice in teaching and a view of education in its larger relationships.

FURTHER STUDY OF LESSON PLANS.

Prof. Whitcomb presented the outline of a plan for a seventh-grade lesson on "Planing the surface of a board," affording a practical illustration of the principles presented by the committee. The discussion which followed, while difficult to report, was regarded as of great value by the members present. At its conclusion the committee

was requested to continue its work, and to make a special study of selected lesson plans to be submitted by members of the conference, and to report at the 1919 meeting.

Investigation seems to indicate that in institutions where no practice teaching is given, or where it is meager in quantity, it is due more to lack of proper facilities than to lack of appreciation of its value.

The discussion also disclosed the existence of an urgent need for a suitable textbook on special methods in industrial arts and trade teaching, and for a carefully edited collection of type lesson plans for use in teacher-training classes.

Prof. Selvidge suggested the desirability of distinguishing two types of lesson: (1) Instruction in a process, or item of technic, which demands one kind of teaching—demonstration, telling; (2) Instruction in how to plan things, in how to understand the reasons for things, in procedure—this demands teaching of a different type, the development plan.

QUESTIONS FOR FURTHER STUDY.

The following questions for further study were suggested:

- (1) Should we undertake the collection of a number of specific solutions of problems—a sort of encyclopedia, in which it would be possible to find, for example, the outline of a certain expert's method of teaching "surface planing," together with a lesson plan for the same?
- (2) Is there a place in the high-school for teaching narrow special skills? Examples: Cabinetmaking, patternmaking, blacksmithing, printing, etc.
- (3) What do we mean by industrial intelligence?
- (4) Is it practicable for the committee to make a study of good teaching in the classroom, laboratory, and shop, and present an analysis of the various phases (such as inductive lesson, demonstration lesson, information-giving lesson) which should be emphasized in the preparation of industrial teachers?

III. DEVELOPMENT OF TEACHER-TRAINING COURSES IN TRADES AND INDUSTRIES.

In opening the discussion of this topic Prof. Smith presented a very interesting chart, showing in parallel columns "What We Need in the Shop Teacher and in the Related-Subjects Teacher." The chart, slightly rearranged, is as follows:

DEVELOPMENT CHART.

RAW MATERIAL.

Shop teacher.

Skilled tradesmen, possessing (a) manual skill, (b) technical knowledge, (c) trade intelligence; special emphasis on (a) and (c).

Related-subjects teacher.

Teacher, technician, or engineer, possessing (a) manual skill, (b) technical knowledge, (c) trade intelligence; special emphasis on (b) and (c).

SOURCE.

(1) Shop-trained men, (2) technical graduates with shop training, (3) trade-school graduates with shop training.

(1) Tradesmen with technical knowledge, (2) two-year technical graduates with practical experience, (3) four-year engineering graduates with practical experience, (4) manual-training teacher with practical experience, (5) men who have completed two years of any standard engineering course and have had practical experience, (6) high-school graduates with practical experience.

HOW TRAINED.

In evening course (extension classes).

(1) Organization of teaching material; trade analysis; (2) "putting it over"; teaching methods; (3) instructional management.

Related subjects—trade mathematics, trade drawing, trade science—to be taught only so far as necessary for effective shop teaching.

In day classes (resident work). (1) Subject matter; (2) organization, and relating of teaching material to trade; analysis of related material; (3) "putting it over"; teaching methods; (4) instructional management.

Related subjects—trade mathematics, trade drawing, trade science—to be thoroughly mastered in their relation to the trade; shop experience necessary to interpret and apply related subjects.

HOW EMPLOYED.

(1) Instructional foremen in industrial plants; (2) shop-class teachers—day, evening; (3) vocational supervisors (in certain cases).

(1) Evening class teachers; (2) day class teachers; (3) vocational supervisors.

SECURING THE RAW MATERIAL.

The raw material for the shop teacher can not, as a rule, be brought to the teacher-training institution. If the latter is not located in an industrial community, it means the establishment of a branch, or an extension center, in a neighboring city to give training in evening classes. Prospective teachers of related subjects may usually be brought to the institution without great difficulty. They may be trained in residence courses, or in evening extension courses, or both.

The following methods were suggested for securing candidates for training as shop teachers: (1) Personal canvass of the men in an industrial plant, recommended by employer or foreman; (2) addressing the locals of various labor organizations, approached through their secretaries; (3) addressing noon meetings in shops; (4) newspaper advertising; (5) mailing letters and application blanks to prospective candidates.

CONTENT OF THE TRAINING COURSE.

In the present unsettled state of training courses for industrial teachers, it may be noted that:

(1) A man who satisfies proper entrance requirements for a class for training shop teachers does not need to be taught the subject matter of his trade.

- (2) A teacher of related subjects, who knows the industry, must be taught the related subjects as related to industry.
- (3) A teacher of related subjects, who knows the related subjects, must be taught industry in its relation to those subjects.

TRADE ANALYSIS.

The first thing to be taught in a shop teachers' course is trade analysis—the determination of what is to be taught, and the proper arrangement of the material in teaching order. Two kinds: (1) Trade analysis which gives a general view of the field to be covered; (2) the job analysis, which goes much more into detail for teaching purposes. Prof. MacDonald, University of Cincinnati, has aptly termed these the "administrator's analysis" and the "instructor's analysis."

TEACHING METHODS.

The second thing to be taught the prospective shop teacher is teaching methods. The shop mechanic knows little or nothing of lesson plans, of the difference between telling and showing and teaching, and all the underlying principles of the teaching process. Teaching is to him a new trade. Instruction and training of men, not production of manufactured articles, is to be his aim. This new trade he must learn, and must change his attitude of mind from that of a producer of a manufactured product to that of the instructor or producer of trained men.

INSTRUCTIONAL MANAGEMENT.

The third thing to be taught the prospective shop teacher is instructional management, the details of handling classes, keeping records, making reports, the organization and management of industrial schools, history of industrial education, and educational psychology (but not too much, and of the right kind). Naturally, he will need also a sufficient knowledge of trade drawing, science, and mathematics to enable him to teach his own shop subject effectively.

THE RELATED-SUBJECTS TEACHER.

The prospective teacher of related subjects may lack either a knowledge of the subject itself, or a knowledge of its industrial applications; consequently, subject matter may be an important part of his course.

In any case it is important for him to make a careful analysis of his trade, under the following heads: (1) Classes of work done; (2) trade science—knowledge of materials, knowledge of tools, knowledge of scientific principles and facts, general knowledge; (3) trade mathematics; (4) trade drawing. Much valuable material for such

analyses will be found in a number of studies prepared by E. G. Allen, Cass Technical High School, Detroit, Mich.

NEW POINT OF VIEW NEEDED.

The whole field of the training of industrial teachers is new, and the institutions concerned can render a great service by attacking the problem of organized training. To render real service, however, they must recognize that the problem is a new one, and requires a knowledge of industry and industrial processes, as well as a knowledge of education and educational processes. The field requires new thought, new ideas, and new methods. It is not merely a new field for the exploitation of old ideas and old methods.

The discussion called attention to the mistake of thinking only of the skilled trades in the study of the problem. The skilled trades form only a small part of the field of industrial education. We must consider also the problem of training men and women for large numbers of occupations, largely operative, in which no great amount of skill is required.

Very little constructive work is being done in this direction at present. Charles R. Allen, of Massachusetts, was quoted as saying: "The usual method of training green help in the factory is by *absorption*. It should be by *intention*."

The proper order of processes for production is not always the proper order for instruction. These things are brought out in a thorough trade analysis, which, as already noted, is a necessary factor in the training of a teacher.

In connection with trade analysis, reference was made to a "difficulty scale," suggested by Mr. Allen, to assist in studying the successive jobs which must be mastered by the learner. In order to determine precisely what makes job No. 2 harder than job No. 1, the "factors in progression" are sought for. The difference will be found (1) in the degree of accuracy of workmanship required, (2) in accessibility, (3) in expense, or (4) in some other ascertainable factor, or in some combination of two or more factors.

It was suggested that teacher-training courses should not employ lecture methods to any considerable extent. Rather, they should consist largely of problems, discussions, definite projects or tasks for members of the class to work at. Diagrams, scales, and tests should be utilized wherever possible. Listening to lectures should be reduced to the minimum.

The number of instructors and teaching-foremen in industrial plants is likely to increase and even to become an important development in industrial education. It will be necessary to safeguard any such plan against abuse and the exploitation of the workers.

If industry assumes in this way the training of the workers needed, would there be further need for the vocational school? (1) The teacher supplied by industry would probably not concern himself with the related subjects, so that this part of the task would remain to be done in any event. (2) It may be found desirable to combine the instruction in the technical processes, given in and by the industry itself, with the necessary supplemental instruction in related subjects, citizenship, physical education, and the like, given in continuation schools under public control.

Three types of courses (in the general field of this discussion) were indicated as necessary: (1) Propaganda courses, for the enlightenment of educators in ultimate responsible control, or in position to influence developments favorably or unfavorably; superintendents of city-school systems, principals of high-schools, presidents of institutions likely to undertake teacher training, and others. (2) Courses for prospective teachers in vocational schools. (3) Courses for prospective directors, supervisors, and coordinators.

IV. INDUSTRIAL ARTS IN SECONDARY SCHOOLS.

One session of the conference was devoted to a discussion of the recommendations set forth in Secondary School Circular No. 4, "Industrial Arts in Secondary Schools," United States Bureau of Education. (See pp. 4, 5.) This report recommends emphasis on definite shop training in high-schools during the next few years.

Although the recommendations were formulated with special reference to the war emergency, there was general agreement that they are equally valid and important in the period of readjustment and reconstruction. In peace times provision for technical and industrial education in this country has lagged behind its leaders, and even farther behind recognized demand. The disruption of ordinary educational processes brought about by the war, and especially war stimulation of industry, has caused a serious loss in the recruiting of skilled workers of all classes.

The demand for large numbers of young people having some practical mechanical ability is so great that schools are urged to do their utmost in offering technical and mechanical instruction.

PRACTICAL SUGGESTIONS.

The correspondence of the Bureau of Education has already resulted in the formulation of a body of definite suggestions as to ways and means by which various educational agencies may assist in bringing about favorable action on the recommendations of the report. The more important of these suggestions may be classified as follows:

(a) BUREAU OF EDUCATION.

The Bureau of Education has been asked to render further assistance in the following ways:

1. Prepare in connection with each subject a bibliography of helpful books, pamphlets, and reports, suggesting what to do and methods of getting results.
2. Prepare detailed outlines of those courses which are regarded as most important for the schools to undertake first.
3. Undertake to have the recommendations presented and discussed at State teachers' conventions.
4. Organize regional conferences of State superintendents of schools, and endeavor to get the States committed to definite campaigns of encouragement for this work.
5. Publish a series of one-page letters focusing attention upon individual recommendations.
6. Disseminate information concerning schools in which the recommendations are being worked out successfully. Stimulate school officials to visit these experiments and adapt the work to their own conditions.

(b) STATE DEPARTMENTS OF PUBLIC INSTRUCTION.

The suggestions of ways in which State departments of public instruction can help include:

7. Attempt to secure official recognition of the program by State superintendents and State boards of education; adoption of all or part of the recommendations as a part of the State educational program.
8. Aid in developing the work in junior high schools; stimulate the organization of strong departments of science and manual training.
9. Assist teacher-training institutions to modify their work in accordance with the recommendations of the report.
10. Organize State and regional conferences of the special teachers concerned, and also of superintendents and principals.

(c) MEMBERS OF THIS CONFERENCE.

Members of this conference, and others holding similar positions, are asked to:

11. Make the report a special subject of study in normal classes, during regular year and summer session. Stimulate students to secure action in schools to which they go.
12. Have students in normal classes write papers on "How the suggestions can be carried out in my school."
13. Make the report a special subject of discussion in faculty meetings.
14. Bring about the appointment of a joint committee of the science and manual training sections of the State teachers' association.
15. Try to reach the graduating classes of high schools in the territory served by your institution. Set forth the needs and opportunities for service as teachers in these special fields.

(d) INSTITUTIONS.

Educational institutions, such as those represented in this conference, may assist:

16. Call meetings of superintendents and principals in the adjacent territory to consider the recommendations of the report.

17. Members of the faculties may utilize speaking engagements to present and discuss the recommendations; teachers' institutes, educational conventions, etc.

18. Advise schools in neighboring communities to change their work to meet the recommendations; members of faculties may assist in various ways.

19. Some institutions have sent out considerable numbers of teachers at least partly prepared to teach handwork who are now used as regular room teachers and principals. If superintendents can be induced to use these teachers for this special work, at least a good foundation can be laid for the industrial work to follow.

(e) IN GENERAL.

20. Some means must be devised to develop public sentiment in favor of more liberal financial support of the schools and higher remuneration for teachers.

21. Every town, city, and county superintendent of schools should receive a copy of this report.

22. Popular magazines, as well as professional journals, should be urged to publish articles setting forth the reasons for study of science and technical subjects.

SOURCES OF SUPPLY.

In the discussion Dean Bennett referred to a statement made to the committee by the Commissioner of Education concerning conditions in Europe. The depletion of the ranks of trained scientists, engineers, and skilled workmen has been much greater than is generally known. The higher schools of technology and engineering have not been turning out men during the past four years, and during the same period the lower schools have been doing practically nothing in preparing boys for the more advanced work. Consequently, there is bound to be a hiatus of at least eight years, probably more, before the higher institutions can resume the production of trained men.

Only in the United States, therefore, is there left any available source of supply of trained men. In determining what we shall undertake in the direction of maintaining and increasing this supply, we must have in mind the conditions and needs of Europe as well as America. What a fine thing it would be for America to repay its debt to Europe to some extent in scientists and engineers! Prior to the establishment of Rensselaer Polytechnic Institute, in 1824 France was practically the only source of supply of engineers for the United States. Now the tables are turned, and for some years to come France, as well as the rest of Europe, must look to us.

EDUCATION OPEN AT THE TOP.

One of the finest of American ideals in education is that it should not be closed at the top. This ideal has been thoughtlessly asserted by some to be opposed to a program of vocational education. Such

an assertion is wholly unwarranted, and arises from complete misconception of what vocational education means.

Vocational education can have no sympathy with an attempt to train a workman who would be content to stay where he is put. Vocational education is diametrically opposed to the idea of prescribing the future careers of boys and girls, by fitting individuals for specific tasks beyond which or above which they are not supposed to look.

The ambition to get ahead and to improve every opportunity must not be killed or discouraged in any degree, and our task is to send out teachers and supervisors of these special lines of work who are inspired with this ideal.

The idea of the "foundation work" in this report has a two-fold value: (1) It is not only a stepping-stone to further training and advancement, but also (2) a goal for those who for any reason can not, for the time being, go any further.

The report represents a genuine effort to bring together for the use of schools practical suggestions as to certain fundamental work within their capacity which needs to be done, showing how the work may be offered in such a way as to leave the door always open to more advanced opportunities for all who can make use of them.

PROBLEM OF THE SMALL SCHOOL.

Some attention was given to the problem of the school which is too small to afford a corps of special teachers and adequate equipment. Prof. VanDeusen pointed out that in Ohio, an industrial State, about 25 per cent of the high schools have an enrollment of 25 or less. This means a large number of schools in communities in which the dominant interests are rural and agricultural, rather than industrial.

One solution suggested is to offer a course divided as follows: (a) Academic subjects, one-half time; (b) agricultural subjects, one-fourth time; (c) boys—industrial subjects, girls—home economics, one-fourth time. To make this plan successful, a group of neighboring schools would need to employ two itinerant teachers, one for agricultural subjects, and one for industrial subjects; and possibly a third, for home economics.

In the working out of this problem, one important preliminary task is to make a list of the things that boys and girls are expected to do, or may do, on the farm, or in the village home. Then teachers should be prepared to show boys and girls how to do these things, and how to educate and develop themselves in the doing.

V. EXAMINATION AND CERTIFICATION OF TEACHERS.

In presenting the report of this committee Prof. Mays outlined the scope of the study which had been made during the year. A brief questionnaire was sent to the 48 State superintendents of public instruction, of whom 43 replied. The questions, and a summary of replies, follow:

1. Are teachers of special subjects required to have the regular certificates required of other teachers? Replies, 39; no, 28; yes, 6; either the regular or a special certificate, 5.
2. Are teachers of special subjects required to hold special certificates? Replies, 43; no, 8; yes, 30; either regular or special, 5.
3. Are any of the following special teachers required to hold special certificates? Drawing, 28; manual training, 29; industrial or trade school, 25; commercial, 27; agriculture, 27; home economics, 30.
4. Before a person may receive a special certificate as manual training teacher, or trade school teacher, what requirements are made as to (1) age, (2) teaching experience, (3) trade experience, (4) scholarship?
 - (a) Manual training teacher: (1) Replies, 30; require applicant to be at least 18 years old, 18; no requirement, 8; remainder vary from 17 to 21 years. (2) Replies, 23; no requirement of teaching experience, 19; remainder vary from 1 to 3 years. (3) Replies, 21; no requirement of trade experience, 17; remainder require 1 or 2 years. (4) Replies, 29; no scholarship requirement, 6; high-school graduation required, 11; remainder vary from grammar school to college graduation.
 - (b) Trade school teacher; (1) Replies, 22; no age requirement, 5; require applicant to be at least 18 years old, 10; remainder vary from 20 to 25 years. (2) Replies, 21; no requirement of teaching experience, 18; remainder require 1 or 2 years. (3) Replies, 20; no requirement of trade experience, 9; require 2 years, 5; remainder vary from "some experience" to 5 years. (4) Replies, 20; no scholarship requirement, 6; require elementary school graduation, 6; require high-school graduation, with 2 years special training additional, 4; remainder vary from "ability to read and write English" to college graduation.
5. What tests, other than written examinations, are given to candidates for special certificates as manual training teachers, or trade school teachers? Replies, 19; no examination of any kind, 11; require written test only, 4; remainder (4) report: "Three separate practical tests prescribed by State superintendent"; "Must show proof of ability"; "Optional with examiners"; "Both written and practical tests."

CONCLUSIONS.

The committee submitted the following tentative conclusions for consideration by the conference:

- (1) State educational authorities generally recognize the importance of issuing special certificates to teachers of special subjects.
- (2) There seems to be recognition of the inadequacy of the ordinary methods of examination for certification when dealing with such special subjects as manual arts.

(3) Few authorities seem to have well-defined ideas as to the character of examinations best suited to the conditions of the special subjects.

(4) Trade experience is not considered of prime importance in qualification for special manual training certificates.

(5) There is very little agreement on the scholarship requirements for special certificates in industrial subjects.

(6) There is urgent need for the formulation of principles which should govern the examination and certification of special teachers.

(7) Some degree of uniformity in State laws governing certification of special teachers is desirable.

After discussion, the conference voted to request the committee to continue its study of the problems of examination and certification of special teachers, and to make a report at the 1919 meeting embodying practical suggestions as to types and methods of examinations, including tests.

VI. SOME LESSONS FROM THE ARMY TRAINING SCHOOLS.

A very interesting discussion centered around the lessons to be drawn from the vocational units of the Army Training Schools. In presenting this subject, Prof. Selvidge outlined briefly the details of the plan, followed by certain tentative conclusions.

PROBLEMS TO BE MET.

(1) The men worked in the shops six hours daily for eight weeks, requiring a new type of organization. One teacher was employed for each 20 men. Since this one class required the entire time of the teacher, the plan did not fit into any school schedule. On account of the overhead expense, units usually consisted of 200 or more men.

The class of 20 men was usually organized into four squads of five men each, one man in each being designated as leader. The instructor did his work chiefly through these squad leaders.

(2) Much new equipment was required for the successful operation of the plan, since one set of equipment was fully occupied by one class of 20 men.

(3) Since the classes covered the ground so much more rapidly than in ordinary school work, much new text material was required, as well as new organization of textbooks. In many cases instructors found that they used up, in much less than the eight weeks, all the text material they had been accustomed to use throughout the entire school course.

(4) The schools had to deal with a new type of student, somewhat more mature than the usual college freshman, but with less schooling.

(5) Because of the large increase in number of teachers required, the work had to be done with a practically new teaching force. In many cases mechanics were brought in from the industries. The plan of daily teachers' meetings was found to be of the greatest value in the conduct of the work.

TENTATIVE CONCLUSIONS.

(1) There seemed to be substantial agreement that *age* is a more important factor than *amount of previous schooling* in determining the rate of progress in these trades classes. In general, it may be said that a young man 20 to 25 years of age who is no more than an eighth grade graduate will go faster and further in this work in 8 weeks than a 17-year-old high-school graduate.

(2) Constant pressure for speed (while still maintaining standards of quality of work) was found to be a highly important factor in accomplishing results.

(3) The shopwork instructor should not attempt to teach new material to more than five or six students at one time. The plan of organizing the classes into groups of five men, each with a leader, was found to be especially important when introducing new material. The instructor first went over the ground with the group leaders, then supervised their work in giving the lesson to the men under their direction.

(4) With students 21 to 25 years of age, the time required for teaching a working knowledge of the technical processes of a trade is very much less than is generally supposed. A number of observers have expressed the conviction that, with certain exceptions, six hours of instruction daily for six months would be sufficient for any one of the usual mechanical trades, under conditions of carefully organized, systematic, and intensive training.

(5) On the basis of 20 students per instructor, in courses six months in length, the cost per student in most trades need not exceed \$100 for instruction, materials, tools, and supervision. This is considerably below the estimates made for such training in the past.

(6) The best results are obtained by concentrated effort, day after day, instead of a few hours each day or on alternate days.

(7) One important reason for the success of these vocational units was that in each case there was a very definite problem, a specific purpose.

(8) The division of labor in many trades is so great that few journeymen know more than one or two of these divisions. Men may be trained in these comparatively narrow lines in a remarkably short time.

(9) There are two important elements in trade training: (a) The development of skill in manipulative processes—a comparatively

simple matter, consisting largely of the repetition of a process until the habit is fixed; (b) the development of resourcefulness, or the ability to meet and master a new situation—a much higher order of training than the first, attained through extending the experience over a wide variety of situations, and developing the attitude of analysis toward a problem. It is in this phase of the training that general education and experience count for most.

(10) Manual training or technical high schools might well establish elective trade courses, from four to six months in length, six to eight hours per day, for those desiring to enter specific trades. These courses need not interfere with the general character of the instruction now given.

(11) One of the finest things that has come out of this experiment is that the instructors learned the importance of presenting their work in a much simpler and more direct way.

VII. HOW MECHANICS ARE TO BE INDUCTED INTO THE WORK OF TEACHING.

In opening this discussion, Prof. Griffith distributed copies of printed forms used by the University of Illinois in inaugurating a scheme of teacher-training through an extension center in Chicago, and outlined the details of the plan.

Following the experience of others, the plan did not prescribe a definite course of study, nor the details of time distribution, but left the instructors in charge to work out all details as the course proceeded. The following theses were presented for discussion:

(1) Where numbers are sufficient to warrant, and the demand for the product (ability to place graduates) is sufficient to absorb it, it is better to organize teacher-training work for shopmen of a single trade independent of that for unlike trades.

(2) Where numbers are sufficient to warrant, it is better to organize teacher-training work for shopmen of a given trade on the departmental plan. That is, the organization should be such that specialists teach special subjects, rather than that one instructor should try to teach everything through development method solely.

(3) Except for administration or direction of the work, the teachers employed, conditions permitting, should know both technical content and methods of teaching. For example, a teacher of applied mathematics should know the trade under consideration.

(4) Courses of study are desirable in that they are necessary for the proper articulation of the work of one teacher with that of others in matters of time and content distribution.

(5) There is now (since the passing of the immediate war emergency) no necessity for curtailing well-rounded courses in order to turn out quickly large numbers of men for teaching positions.

QUESTIONS FOR FURTHER STUDY.

(1) What should be the length of course for training teachers of related technical work? Some States began with four-year organized courses, which have now been reduced to two years; in some cases even a one-year course has been proposed.

(2) What should be the relative amounts of each of these elements in a teacher-training course: (a) Shopwork, (b) related technical work, (c) professional studies, (d) nonvocational work?

(3) Just what should constitute the subject matter and purpose of each of these elements?

(4) Two methods of staff organization have been proposed: First, (a) shop teacher, (b) teacher of related technical subjects, (c) teacher of nonvocational subjects; and second, (a) teacher of shop and related technical subjects, (b) teacher of nonvocational subjects. Which is the better organization?

(5) If the shop teacher is to teach also the related technical subjects, will not the best and most expeditious results be obtained by selecting a technically trained man and sending him into the industry under favorable auspices to secure the necessary trade knowledge?

UNIVERSITY OF INDIANA.

Prof. Buxton reported on the program of trade and industrial teacher training now being carried out in different parts of Indiana under the direction of the State university. The plan is intended to carry the preparation for teachers to the tradesmen in their own towns, in connection with local evening schools, but furnished under the supervision of the university. Professional courses are taught by representatives of the university who make weekly trips to the extension centers, and courses in related subjects are given by teachers from the local schools.

In this way, the State requirement of 240 hours of instruction is met in two years, two evenings per week, two hours per evening. The report described the work in Indianapolis, Evansville, Anderson, and Richmond, in which four cities 136 men are enrolled in these special classes.

Indiana provides four types of school in State plans for industrial education: (1) Day vocational schools, including trade schools and vocational departments in high schools, at least one-half of pupil's time being devoted to shopwork; (2) general industrial schools to meet vocational and prevocational needs in smaller communities; (3) part-time schools, offering trade extension courses and general continuation courses of not less than four hours per week, for young people 14 to 18 years of age; (4) evening schools, providing short unit trade courses meeting immediate needs of industrial workers in their daily occupations. Students interested in each type of school are now enrolled in teacher-training courses.

Conferences with representatives of labor organizations and talks with the men in their meetings show a recognition of the value of trade teaching and a willingness to cooperate in promoting voca-

tional education. Tradesmen show a strong interest in the teaching of industrial work and especially in instruction in related subjects for which they themselves feel a strong need.

Talks with factory managers show a growing interest in the training of skilled workers. There is an evident tendency toward the employment of a larger proportion of unskilled workers, and yet the need for skilled workers is recognized. The education of large employers of labor is one of the biggest and most important jobs facing the city director of vocational education.

A number of interesting letters from members of the teacher-training class were read, showing that there is little opportunity for advancement in industry except by constantly moving from one factory to another, and expressing the conviction that education is the only solution of the more difficult trade problems from the standpoint of the worker.

There are certain advantages in having representatives of a number of different trades in the same teacher-training class. For example, in one class the topic for discussion was "Job Analysis." A milliner gave an analysis of "making a sleeve"; a cook gave an analysis of "making a fire"; a plumber gave an analysis of "replacing a washer in a faucet"; etc. All members of the class profited by the opportunity to see how others attacked and solved their own special problems.

Following up certain phases of the discussion, Prof. Selvidge suggested: (1) We should have more clearly stated and more definite aims in our manual training and technical high-school work; (2) we should devise some means of checking up our progress toward the realization of these aims; (3) the fundamental purpose of high-school work is not trade training.

SUMMARY OF DISCUSSION.

In summarizing the discussions Prof. Laubach, Prof. Rodgers, and Dean Bennett called attention to the emphasis that was given throughout the conference to "The things that we have learned from our war experience with industrial education, and the importance of taking advantage of these lessons in reconstruction and readjustment." The following points were noted:

- (1) Importance of definiteness of aim.
- (2) We must adjust our work to the needs and capacity of the student more successfully than we have in the past.
- (3) The age of the student is of greater importance than we have realized. In some cases, and up to a certain point, age and maturity have proved a satisfactory substitute for scholastic attainment.
- (4) Instruction in industrial processes should reach the farmer and the farmer's boy.

(5) The humanistic element is essential in any program for vocational education. It is absolutely essential that the workers shall understand the point of view of all important social groups.

(6) This discussion demonstrates that we have learned some valuable lessons about the training of skilled mechanics.

(7) One important suggestion on class organization is the use of squad leaders.

(8) There is need of more effective means of testing the qualifications of prospective teachers.

(9) In training trade teachers we are using an expensive "hand-picked" process that is certain to yield results. What might be the results if this method were applied in cases of other much-needed types of teachers?

QUESTIONS FOR FURTHER STUDY.

(1) Should the shop teacher or the related-subjects teacher be responsible for the "applications" of the trade drafting, science, mathematics, etc.?

(2) Trade tests, as developed by the Committee on Education and Special Training, War Department, and others.

(3) What should be the field and the program of the "General industrial school"?

(4) How may shop teachers and teachers of related subjects be brought together, in order to have better mutual understanding and sympathy?

RESOLUTIONS.

The following resolutions were adopted:

(1) High-school shop facilities should be used more fully than at present for vocational instruction. Industrial arts courses in junior and senior high schools should emphasize vocational exploration as an aim.

(2) Whereas the Bureau of Education has prepared and published a circular entitled "Industrial Arts in Secondary Schools in the War Emergency;" and

Whereas this circular contains suggestions and course of study outlines suitable for times of peace, and in advance of the present practice in many schools; and

Whereas the mere publication of this circular will not insure the full consideration of these suggestions and outlines by the supervisors, principals, and teachers of the country: Therefore be it

Resolved, That we bring to the attention of the United States Commissioner of Education the importance of promoting the ideas set forth in this circular, by preparing and publishing illustrated circulars based on this one, giving more details and examples of the successful carrying out of these ideas.

(3) The members present adopted a resolution requesting the Commissioner of Education to issue a call for a similar conference of men from institutions in the Mississippi Valley engaged in training teachers of the manual arts and industrial subjects, to be held at some time between the middle of November and the middle of December, 1919.

(4) In case such a conference is held in 1919, it is recommended that it be held at the University of Cincinnati, Cincinnati, Ohio.